

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR PATENT

TITLE: POSITIONAL RESPONSIVE TRAFFIC SIGN AND SYSTEM

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BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to sign exhibiting traffic control signals such as used by school guards, road construction crews and other persons in situations where there is a need for signals which are positional or conditionally responsive to direct the actions of individuals.

2. Description of the Prior Art

The orderly and safe flow of vehicular and pedestrian traffic is dependent on the proper functioning of a variety of traffic control devices. Traffic safety is a growing concern throughout the world. Each year, more and more people are being injured and/or fatally wounded due to accidents. Traffic control devices range in complexity from simple placard-type signs to combination electric signal lights and vehicle sensors. The development and use of this variety of display devices is not just to control the flow of traffic, but also to advise of hazardous road conditions such as curves, construction, road icing, school crossings, pedestrian directions and the like. Many accidents are caused because one inadvertently fails to read and/or identify traffic warning signs. Many individuals are so preoccupied by activities about them that they fails to see warning signs.

1 Our environment is saturated with signs and signals which are not recognized by the
2 person(s) who may be endangered.

3 Innovations in this area continue to be motivated to provide condition responsive
4 traffic control devices. Typical examples of such devices include variable timer circuits
5 present to control signal light cycling intervals according to expected rush-hour and non
6 rush-hour traffic volume and embedded road surface vehicle sensors for initiating a signal
7 light cycle. Generally, the condition responsive control devices respond to an unplanned
8 change in the condition of the environment, such as a power outage, flooding, freezing
9 temperature or the like. Speciality traffic control devices have been developed to try to
10 address the problem of certain unplanned changes in the environment which affect the
11 orderly flow of traffic or represent potential hazards.

12 Hand-held traffic control signs are well known. A large number of these consist of
13 an octagonal frame with a handle extending out at the lower side. That type sign has a
14 face which is usually red with "STOP", and yellow showing "SLOW" or similar cautionary
15 terms in bold letters across the face. These have served a useful purpose in the past and
16 have been widely used. However, some of these are not as easily seen in inclement
17 weather, darkness, twilight or dusk as desired. Various lighted sign structures have been
18 suggested none of which are lighted in response to the position of the sign and determined
19 by the user and which may initiate control signals to other devices in combination
20 therewith to enhance safety.

21 Motor vehicle drivers' habits and driving awareness vary, depending on a series of
22 obstacles in driving proficiency. Some examples are: the posted speed limit, number of
23 travel lanes, the driver behind scenes, the sun just rising or setting creating a glare in
24 visibility, the driver is reading or writing while he/she drives, the driver is using a cell
25 phone, the driver is disciplining children, the volume of their stereo set high, and the
26 obstructions on roadways. The short list of examples above reflect only a partial list of
27 why commanding the motorist's attention on what is going on outside the vehicle, and on
28 the roadway is becoming increasingly more and more difficult.

1 Flashing lights have been used for decades to gain motorist awareness from simple
2 businesses displaying these signs or traffic signs themselves. Simple flashing of signs no
3 longer gains the motorist attention due to the partial list of examples above. We have
4 incorporated into our device, single light emitting diodes, hereinafter referred to as "LED",
5 in self contained clusters of three LEDs in an optical exact light output magnification
6 refection which creates a brilliant light output. Built into this three cluster LED lighting
7 device are multiple flashing sequences and even a "steady" burn cycle all for gaining and
8 demanding the motorist complete attention while traveling the roadway.

9 A second self enclosed set of three individual LED lights in an identical maximum
10 optically correct light can be supplied for roadway situations, such as four or six travel
11 lanes which carry higher volumes of traffic at various speeds. The second set of LEDs
12 may be programmed to work identically as the first set of LEDs, or work in an alternating
13 flashing sequence as well as multiple settings of flash cycles.

14 Accordingly, an object of the present invention is to provide a hand-held device into
15 which a sign may be forcefully inserted to provide a sign that is highly visible to an
16 approaching motorist or pedestrian.

17 Another object of the invention is to provide a road sign that is lightweight and easy
18 to hold for extended periods of time.

19 Still another object of the intention is to provide a hand-held sign that is effective to
20 flash or be lighted only when the user desires to effect a viewer's recognition and response
21 and/or to remotely control other signals responsive to the same user reaction and control.

22 Still another object of this invention is to provide lighting that is selectively
23 configured to simply light, flash, flash in a pre-determined sequence and/or colors for a
24 desired display.

25 Yet another object of the present invention is to provide a portable, hand-held device
26 that includes circuitry to cause a signal to be transmitted to a remote signaling device

1 which operates in unison or a predetermined sequence with the hand-held device.

2 A further object of the present invention is to provide illumination means comprised
3 of light emitting diodes (LEDs) which are programmable to flash in a predetermined
4 sequence and/or colors.

5 **BRIEF SUMMARY OF THE INVENTION**

6 The above objects are achieved with a portable hand-held device for selective
7 engagement with a sign wherein the hand-held device utilizes a positional sensitive switch
8 to activate lights to illuminate the surface of a sign to cause superior recognition of such
9 sign at all times and in inclimate conditions as well as being interactive with a remote sign
10 for selective control thereof.

11 The sign includes a front unitary side and a back unitary side which may be
12 selectively engaged into the handle of the hand-held device having switching means therein
13 for voluntary control of the lighting effect of the sign. In an alternate embodiment the
14 hand-held device embodies switching means for activating a signaling means for control
15 of a remote lighting means for further indication to viewers a desired message.

16 In a preferred embodiment, the two sides of a sign are nearly symmetrical. The hand
17 held device has a slit therein for forcibly receiving the sign or other structure there into in
18 a mating relationship. The hand-held device houses a switch which is positional sensitive
19 to cause the sign to be lighted when held in a preferred position and extinguished
20 otherwise to thus permit the user to voluntarily determine when to optimize the
21 recognition of the sign.

22 A sign of one's choice may be selectively engaged into the handle for use. Each side
23 of the slit has a surface that is textured to maintain the sign within the slit's confines. An
24 electrical power source is operatively connected to the hand-held device through a switch
25 to energize the illumination means. The hand-held device may also include a transmitter
26 which is energized when the illumination means is energized to transmit a signal to a
27 remote receiver for thus energizing a lighting means at a remote location. When the hand-

1 held device is positionally changed to cause the illumination means (lights) to be
2 extinguished, a signal is then transmitted to the received to turn off the illumination means
3 at the remote location.

4 **BRIEF DESCRIPTION OF THE DRAWINGS:**

5 **FIG. 1** is a partly perspective view of a prior art hand-held sign of conventional type
6 used to direct traffic or school crossings.

7 **FIG. 2A** is a side view of a preferred embodiment of a hand-held device without a
8 sign inserted there into.

9 **FIG. 2B** is a left side view of FIG 2A.

10 **FIG. 3** is a perspective view showing a front side of the hand-held device with a sign
11 partially inserted there into according to a preferred embodiment of the present invention.

12 **FIG. 4** is a front view of the hand-held device 2 as shown in FIG. 2A with a sign
13 positioned the hand-held device.

14 **FIG. 5** is a perspective view of a hand-held device with a "stop" sign mounted
15 therein and disclosing a power supply attached to the handle for illumination of the lighting
16 effects of the combination.

17 **FIG. 6** discloses a remote illumination means 19 which may be remotely controlled
18 by hand-held device 2.

19 **FIG. 7** discloses a preferred embodiment schematic diagram of hand-held device 2,
20 in combination with a remote illumination means 19 and related apparatus such a power
21 supply 12, controller 17 and lighting means 14 and lighting means 16.

1 **FIG. 8** discloses a remote illumination means on a traffic cone remote to the hand-
2 held device.

3 **FIG. 9** is a perspective view of the illumination means of **FIG. 8**.

4 **FIG. 10** is a side view of **FIG. 9** wherein the front side, the back side, the right side,
5 the left side and the top side are identical as visually perceived.

6 **FIG. 11** discloses a schematic diagram of hand-held device **2** in combination with a
7 remote illumination means similar to that disclosed in **FIG. 7** which embodies arrays of
8 light emitting diodes.

9 **FIG. 12** discloses an alternative embodiment of the present invention wherein the
10 remote illumination device is a traffic cone with illumination means.

11 **FIG. 12** discloses a schematic diagram of hand-held device **2**

12 **DETAILED DESCRIPTION OF THE INVENTION**

13 Referring now to the drawings, the details of preferred embodiments of the present
14 invention are graphically and schematically illustrated. Like elements in the drawings will
15 be represented by like numbers.

16 The present invention provides a hand-held device for forcibly receiving a sign there
17 into that is easier to hold for long periods of time and more visible, as viewed from long
18 distance by oncoming motorist. Various signs may be used as determined by the use.
19 Preferred embodiments of the invention are versatile because they allow different sign
20 expanses to be interchanged on the same basic frame and structure. The invention also
21 includes a combinational use of the hand-held device in combination with a remote light
22 fixture to further implement cautionary alert of viewers.

23 **FIG. 1** discloses a well-known hand-held prior art sign familiar to individuals for

1 indicating when traffic or individuals are to stop.

2 Referring to FIG. 2A, hand-held device 2 has lighting means 4 and lighting means
3 6 which are directionally opposite to each other. There is a slit or groove 8 which is
4 between illumination means 4 and illumination means 6 and along the longitudinal axis 7
5 of hand-held device 2. Slit 8 has a first side 9 and a second side 11 which are resilient, that
6 is, they are rigid and non-deformable under normal use. The first side 9 of slit 8 has an
7 interior surface 13 and the second side 11 of slit 8 has an interior surface 15 which are
8 juxtaposed. Juxtaposed surfaces 13 and 15 of slit 8 are textured to affirmatively grasp a
9 structure which is forcibly inserted into slit 8 in a secure manner. One may remove the
10 structure so inserted and insert a different structure dictated by the need of the user of the
11 hand-held device 2.

12 Lighting means 4 has an aperture 7 which is an opening into the interior of lighting
13 means 4 to thus permit light to be emitted upwardly to illuminate sign 10 (FIG. 3)
14 disposed in slit 8. Lighting means 6 has an aperture 5 which is an opening into the interior
15 of lighting means 5 to thus permit light to be emitted upwardly to illuminate sign 10
16 disposed in slit 8.

17 FIG. 2B discloses a left side view of FIG 2A showing lighting means 6. Lighting
18 means 6 may have an aperture 5 to thus permit light from lighting means 6 to be emitted
19 upwardly to illuminate sign 10. The right side of FIG.2A is identical to the left side shown
20 in FIG. 2B.

21 FIG. 3 discloses structure 10 which is partially inserted into hand-held device 2. As
22 structure 10 is positioned into slit 8, the internal side 13 and internal side 15 of the slit 8
23 (FIG.2A) grasp structure 10 to securely hold structure 10.

24 Hand-held device 2 is further disclosed in FIG. 5 as being selectively connected to
25 power supply 12 which supplies the power to cause the illumination means 4 and
26 illumination device 6 to be selectively illuminated. Power supply 12 may be connected to
27 the hand held device 2 through controller 17 for selectively energizing the lighting means

1 **4** and lighting means **6** of the hand held device **2** to cause lighting means **4** lighting means
2 **6** to pulse in a predetermined manner or to have a steady burn as desired by the user.

3 Hand-held device **2** may be used to control a sign or illumination device **19** (FIG. **6**)
4 that is remote to hand-held device **2**. Illumination device **19** comprises illumination means
5 **14** and illumination means **16** which are responsive to a control system housed in structure
6 **18**. The entire structure is supported on a vertical member **21**. The details of the control
7 system in structure **18** are disclosed in FIG. **7** to include a receiver **26** with an internal
8 switch **28**, a power supply **30** for energizing lighting means **14** and lighting means **16**.

9 FIG. **8** represents a traffic cone which has mounted thereon an illumination means
10 **80** which has mounted thereon various arrays of lighting means **84a**, **86a**, **88a**, **90a** and
11 **92a**.

12 A schematic of the electrical connections of hand-held device **2** and remote
13 illumination device **19** are shown in FIG. **7**. Hand-held device **2** comprises a first switching
14 means **20** which is positionally responsive to cause switch **20** to be in a closed position
15 when hand-held device **2** is caused to be in a predetermined posture. When switch **20** is
16 closed, lighting mens **4** and lighting means **6** are energized. When the position of hand-
17 held device **2** is changed, switch **20** will open to thus cause lighting means **4** and lighting
18 means **6** to be extinguished (the electric current supply **12** is disconnected from said
19 illumination means **4** and illumination means **6**).

20 Controller **17** may be connected between power source **12** and lighting means **4** and
21 lighting means **7** to thereby control the particular lighting sequence of lighting means **4**
22 and lighting means **6**.

23 Switching means **22** is positionally responsive in the same manner as switching
24 means **20**. When switching means **20** is open, switching means **22** is in position **A**. When
25 switching means **20** is closed, switching means **22** is in position **B**. Switching means **20**
26 and switching means **22** are positioned to respond to the position of the hand-held device
27 **2** in like manner.

1 The purpose of switching means 22 is to activate transmitter 24 which is a
2 transmitter readily available in the art which transmits a signal to be received by state-of-
3 the art receiver 26 to cause switching means 28 to be closed to thus cause illumination
4 means 14 and illumination means 16 to be energized by power supply 30. In this manner,
5 remote illumination device 19 is energized in sequence with hand held device 2.
6 Transmitter 24 and receiver 26 are state-of-the-art devices which inherently include an
7 internal power source for powering the transmitter 27 and/or the receiver 28.

8 When hand held-device 2 is positioned to cause the lighting means 4 and lighting
9 means 6 thereon to be extinguished (switch 20 is open) and switch 22 is position A, the
10 transmitter is thus caused to emit a signal which signal is received by receiver 26 to cause
11 switch 28 to open to extinguish illumination means (lights) 14 and illumination means 16.

12 Controller 32 of remote illumination device 19 may be selectively connected between
13 power supply 30 and lighting means 14 and lighting means 16 to thus cause lighting means
14 14 and lighting means 16 to pulsate or be illuminated in a predetermined manner for best
15 viewer recognition.

16 Illumination means 4 and illumination means 6 (FIG. 4) may be an array of light
17 emitting diodes (LEDs) which flash in a predetermined sequence or burn or flash as an
18 array. Such arrays are available in the prior art and provide a new and useful application
19 for such embodiments as the present invention. The LEDs may be of varying colors, red,
20 amber, white or other variations, in combination or singularly displayed. The same
21 principles apply to light emitting means 14 and light emitting means 16 (FIG. 6 and FIG.
22 7). Light emitting means 14 and light emitting means 16 are bi-directional in that the light
23 is directed in exact opposite directions from the sign by each illumination means. In the
24 schematic disclosed in FIG. 7, lighting means 14 and lighting means 16 may be light
25 emitting diode array 4 and light emitting diode array 6 as disclosed in FIG. 11.

26 FIG. 11 discloses an alternative embodiment wherein light means 4 is particularly
27 adapted to use an array of light emitting diodes 4a. An array of light emitting diodes 4a
28 are selectively illuminated by controller 4b to cause the light emitting diodes 4a to

1 sequentially flash, strobe in unison or just be illuminated “burn” in unison. The particular
2 manner in which light emitting diodes **4a** illuminate is selectively determined by controller
3 **4b**.

4 FIG. 11 further discloses an alternative embodiment wherein light means **6** is
5 particularly adapted to use an array of light emitting diodes **6a**. An array of light emitting
6 diodes **6a** are selectively illuminated by controller **6b** to cause the light emitting diodes **6a**
7 to sequentially flash, strobe in unison or just be illuminated “burn” in unison. The
8 particular manner in which light emitting diodes **6a** illuminate is selectively determined by
9 controller **6b**.

10 Lighting means **14** and lighting means **16** disclosed in FIG. 6 may also be light
11 emitting diodes as disclosed in FIG. 11 instead of incandescent or other lighting bulbs
12 commonly known in the art. Lighting means **80** on traffic cone **82** may be light emitting
13 diodes as disclosed in FIG. 11.

14 FIG. 8 discloses a further embodiment of a remote control device such as is
15 disclosed in FIG. 6. Many traffic control situations such as school crossings utilize a cone
16 usually orange in color. While the selected color attracts the attention of pedestrians and
17 motorists, the recognition factor may be improved by positioning an illumination means
18 **80** on top of cone **82**. Illumination means **80** may be illuminated during certain times as
19 when school children are leaving school. Alternatively, lighting means **80** may be remotely
20 controlled by hand-held device **2** by way of the circuitry disclosed in FIG. 12. In this
21 manner, lighting means **80** is selectively energized as determined by the user of hand-held
22 device **2**. When hand-held device **2** is positioned in a predetermined posture, transmitter
23 **24** (FIG. 12) will cause a signal to be transmitted to receiver **26** to thus cause illumination
24 means **80** (FIG. 8 and FIG. 12) to be energized.

25 Illumination means **80** is further disclosed in FIG. 8 to disclose lighting means **84a**
26 on side **84** of illumination means **80**, lighting means **86a** on side **86** of illumination means
27 **80**, lighting means **88a** on side **88** of illumination means **80**, lighting means **90a** on side **90**
28 of illumination means **80** and lighting means **92a** on side **92** of lighting means **80**. While

1 it is disclosed that a lighting means is disposed on each side of illumination means 80
2 except for the bottom side, it is not necessary that each side of illumination means 80 be
3 illuminated as only one selected side may be lighted as determined by the environment of
4 use. Each side 84, 86, 88, 90 and 92 of illumination means 80 may be identical as shown
5 in the side view disclosed in FIG. 10.

6 Illumination means 80 may be an array or light emitting diodes. For example,
7 lighting means 84a may an array of light emitting diodes and associated controller as is
8 lighting means 4 and lighting means 6 disclosed in FIG 11. Thus, each lighting emitting
9 diode array may be caused to pulsate or burn in a predetermined manner. Each side of
10 illumination means 80 may be comprises of selected lighting means. Lighting means 84
11 a and lighting means 86a and lighting means 88a and lighting means 90a and lighting
12 means 92a may be identical or may be of different colors and/or types of lighting means
13 such as incandescent or light emitting diodes or other lighting means available in the prior
14 art. Each such lighting means may have circuitry such as lighting means 4 of hand-held
15 device 2 as disclosed in FIG. 11.

16 While the above description contains many specifics, these should not be construed
17 as limitations on the scope of the intention, but rather as exemplifications of one or another
18 preferred embodiments thereof. Many other variations are possible, which would be
19 obvious to one skilled in the art. Accordingly, the scope of the invention should be
20 determined by the scope of the appended claims and their equivalents, and not just by the
21 embodiments.

22 It is therefore understood that while certain forms of this invention have been
23 illustrated and described, it is not limited thereto except insofar as such limitations are
24 included in the following claims and allowable functional equivalents thereof.

25 Having thus described the invention, what is claimed as new and desired to be
26 secured by Letters Patent is as follows:

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